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EXAMINER	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/714,617	CHIU ET AL.	
	Examiner	Art Unit	
	Joel Stoffregen	2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on 01 August 2007.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-38 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-38 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

1. This communication is in response to applicant's amendment filed 08/01/2007. The applicant amended claims 8, 21, 26, and 36, and cancelled claims 39 and 40. Claims 1-38 are currently pending in this application.

The examiner withdraws the previous claim objection, because the applicant amended the corresponding claim.

Response to Arguments

2. Applicant's arguments, with respect to rejections under 35 USC 101 have been fully considered and are persuasive. The rejection of claims 36-38 under 35 USC 101 has been withdrawn.

Applicant's arguments, with respect to rejections under 35 USC 103 have been fully considered but they are not persuasive.

The applicant argues that the video encoding techniques of Chen et al. (6,263,022) cannot be applied to an audio signal (see p. 15 of applicant's remarks). However, video encoding is well-known to share many of the same techniques as audio encoding, as evidenced by Jayant et al. (*Signal Compression Based on Models of Human Perception*). Jayant states that "there are four fundamental operations that are common to low bit rate signal coding: prefiltering to render a signal more 'acceptable' to a bit-rate-constrained coder, reduction of signal redundancy in the input signal, removal of irrelevant information in the operation of quantization, and signal enhancement by

post filtering" (p. 1392, section I: Tools of the Trade). Jayant then proceeds to explain similar encoding steps used in audio, image, and video coding (see FIGs. 7, 10, 11, 12, and 16). Given all the overlap between video and audio coding techniques shown by Jayant, the examiner contends that it would have been obvious to use the bit shifting technique taught by Chen on analogous features of an audio signal.

The applicant further argues that "Chen's teaching of shifting of DCT components does not constitute 'bit shifting the quantized data in the sub-bands'" (see p. 14 of applicant's remarks). However, the examiner relied upon Park et al. (6,529,604) to teach the quantized data in the sub-bands (see Park, column 7, lines 65-66). The examiner contends that it would have been obvious to apply the bit shifting of Chen on the quantized data of Park. The DCT coefficients of Chen are analogous to quantized data of Park, as they are a digital representation of frequency components. A signal cannot be represented digitally without being quantized in some manner.

The applicant further argues that "using quantization step size as shifting factor does not constitute 'bit shifting the quantized data in the sub-bands by the respective scale factors'" (see p. 14 of applicant's remarks). However, the examiner relied upon Park et al. (6,529,604) to teach the scale factors (see Park, column 9, lines 42-47). The examiner contends that it would have been obvious to use the scale factors of Park to adjust the bit shifting factor of Chen. The quantization step size of Chen is analogous to the scale factors of Park, as quantization step size is directly related to the scale factor, as evidenced by Surucu (6,542,863). An increase in the scale factor value effectively decreases the quantization step size, and vice versa (see Surucu, column 4, lines 2-12).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-7, 9-25, and 27-38** are rejected under 35 U.S.C. 103(a) as being unpatentable over PARK et al. (Patent No.: US 6,529,604) in view CHEN et al. (Patent No.: US 6,263,022).

5. Regarding **claim 1**, PARK teaches a method for processing audio signals ("encode and decode scalable stereo digital audio data", column 6, lines 53-54) comprising:

quantizing the audio signals in spectral lines into quantized data in a plurality of sub-bands ("quantizing portion 160 scalar-quantizes the frequency signals of each band", column 7, lines 65-66) in an order of most significant bits to least significant bits ("ranging from the MSB sequences to the LSB sequences", column 8, lines 23-24);

determining a plurality of scale factors corresponding to each of the sub-bands ("scale factors for the respective scale factor bands... are generated", column 9, lines 45-47) according to respective noise tolerance of each of the sub-bands ("so that the

magnitude of the quantization noise of each scale factor band is smaller than the masking threshold", column 9, lines 42-43);

coding the quantized data ("bitstream forming portion 180 generates bitstreams", column 8, line 33); and

truncating the quantized data (""bitstreams of lower bitrate", column 8, line 39).

However PARK does not disclose bit shifting the quantized data.

In the same field of scalable coding, CHEN teaches bit shifting the quantized data in the sub-bands ("perform bitplane shifting of frequency domain coefficients", column 6, lines, 36-37) by the respective scale factors ("shifting factors are determined solely as a function of the base layer", column 7, lines 30-31, where "the shifting factor acts similarly to the quantization step size used in the base layer", column 7, lines 49-50) if they exceed a threshold value ("by identifying blocks or macroblocks that have ... high quantization errors, and the like", column 6, lines 60-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

6. Regarding **claim 2**, PARK further teaches:

de-quantizing the coded data ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23); and

decoding the coded data ("bit-sliced arithmetic decoding portion 310 decodes side information and bit-sliced quantized data", column 8, lines 62-63).

However PARK does not disclose de-shifting the coded data.

In the same field of scalable coding, CHEN teaches de-shifting the coded data ("bit-planes are shifted only downward in the video decoder", column 13, lines 30-31).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

7. Regarding **claim 3**, PARK further teaches:

amplifying the quantized data with the respective scale factors ("quantizing portion 160 scalar-quantizes the frequency signals of each band so that the magnitude of the quantization noise of each band is smaller than the masking threshold", column 7, lines 65-67); and

de-amplifying the decoded data with the respective scale factors ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23).

8. Regarding **claim 4**, PARK further teaches determining a difference of the quantized data and the de-quantized data ("difference between the predicted value and the actual frequency component is quantized and coded", column 7, lines 47-49).

9. Regarding **claim 5**, PARK further teaches coding the quantized data in a base layer and an enhancement layer ("after the coding of the base layer is completed, the side information for the next enhancement layer and the quantized values of audio data are coded", column 8, lines 28-31).

10. Regarding **claim 6**, PARK further teaches truncating the quantized data in the enhancement layer up to respective layer size limits ("remaining quantized data uncoded due to a layer size limit", column 6, lines 16-17).

11. Regarding **claim 7**, PARK further teaches arithmetically coding the quantized data ("bit-sliced data are arithmetic-coded", column 11, lines 15-16).

12. Regarding **claim 9**, PARK further teaches converting the audio signals from a time domain to a frequency domain ("time/frequency mapping portion 100 converts input audio signals of a temporal domain in to audio signals of a frequency domain", column 7, lines 23-25).

13. Regarding **claim 10**, PARK further teaches converting the decoded data from a frequency domain to a time domain ("frequency/time mapping portion 370 converts inversely quantized signals into signals of a temporal domain", column 9, lines 24-25).

14. Regarding **claim 11**, PARK teaches a system having an encoder and decoder processing audio signals ("encode and decode scalable stereo digital audio data", column 6, lines 53-54) comprising:

an encoder ("encoding apparatus", column 6, line 64) including

a quantizer quantizing the audio signals in spectral lines into quantized data in a plurality of sub-bands ("quantizing portion 160 scalar-quantizes the frequency signals of each band", column 7, lines 65-66) in an order of most significant bits to least significant bits ("ranging from the MSB sequences to the LSB sequences", column 8, lines 23-24);

a psychoacoustic model determining a plurality of scale factors corresponding to each of the sub-bands ("scale factors for the respective scale factor bands... are generated", column 9, lines 45-47) according to respective noise tolerance of each of the sub-bands ("so that the magnitude of the quantization noise of each scale factor band is smaller than the masking threshold", column 9, lines 42-43);

a coder coding the quantized data ("bitstream forming portion 180 generates bitstreams", column 8, line 33);

a de-quantizer de-quantizing the quantized data ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23);

a subtractor taking a difference of the quantized data and the de-quantized data ("difference between the predicted value and the actual frequency component is quantized and coded", column 7, lines 47-49); and

a bit slicer coding ("bit-sliced arithmetic coding portion 170", column 8, line 18) and truncating the difference (""bitstreams of lower bitrate", column 8, line 39).

However PARK does not disclose a bit shifter.

In the same field of scalable coding, CHEN teaches a bit shifter shifting the difference in the sub-bands ("perform bitplane shifting of frequency domain coefficients", column 6, lines, 36-37) by the respective scale factors ("shifting factors are determined solely as a function of the base layer", column 7, lines 30-31, where "the shifting factor acts similarly to the quantization step size used in the base layer", column 7, lines 49-50) if they exceed a threshold value ("by identifying blocks or macroblocks that have ... high quantization errors, and the like", column 6, lines 60-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

15. Regarding **claim 12**, PARK further teaches:

a decoder having a scale factor decoder decoding the scale factors ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23);

a spectrum decoder decoding the quantized data ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23); and

a decoder decoding the coded data ("bit-sliced arithmetic decoding portion 310 decodes side information and bit-sliced quantized data", column 8, lines 62-63).

However PARK does not disclose a de-shifter de-shifting the coded data.

In the same field of scalable coding, CHEN teaches a de-shifter de-shifting the coded data ("bit-planes are shifted only downward in the video decoder", column 13, lines 30-31).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

16. Regarding **claim 13**, PARK further teaches a filter converting the quantized data from a time domain to a frequency domain ("time/frequency mapping portion 100 converts input audio signals of a temporal domain in to audio signals of a frequency domain", column 7, lines 23-25).

17. Regarding **claim 14**, PARK further teaches a filter converting the decoded data from a frequency domain to a time domain ("frequency/time mapping portion 370 converts inversely quantized signals into signals of a temporal domain", column 9, lines 24-25).

18. Regarding **claim 15**, PARK further teaches an adder adding the decoded data ("predicted signal is added with a difference signal decoded by the bitstream analyzing portion 300", column 9, lines 7-8).

19. Regarding **claim 16**, PARK further teaches that the quantized data are amplified ("quantizing portion 160 scalar-quantizes the frequency signals of each band so that the magnitude of the quantization noise of each band is smaller than the masking threshold", column 7, lines 65-67) and, the decoded data de-amplified, with the respective scale factors ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23).

20. Regarding **claim 17**, PARK further teaches a bit slice arithmetic encoder coding the quantized data ("bit-sliced data are arithmetic-coded", column 11, lines 15-16).

21. Regarding **claim 18**, PARK further teaches that the system is implemented in an additive fine granularity scalability structure ("fine granule scalability can be implemented", column 12, line 65).

22. Regarding **claim 19**, CHEN further teaches that the least significant bits are discarded after the bit shifting (this is inherent in bit shifting, as there are no longer bits in the least significant places to code, see column 3, lines 9-11).

23. Regarding **claim 20**, PARK further teaches that the quantized difference is coded in a base layer and an enhancement layer ("after the coding of the base layer is completed, the side information for the next enhancement layer and the quantized values of audio data are coded", column 8, lines 28-31), and the quantized difference in the enhancement layer is truncated up to respective layer size limits ("remaining quantized data uncoded due to a layer size limit", column 6, lines 16-17).

24. Regarding **claim 21**, PARK teaches a method for processing audio signals ("encode and decode scalable stereo digital audio data", column 6, lines 53-54) comprising:

quantizing the audio signals in spectral lines into quantized data in a plurality of sub-bands ("quantizing portion 160 scalar-quantizes the frequency signals of each band", column 7, lines 65-66) in an order of most significant bits to least significant bits ("ranging from the MSB sequences to the LSB sequences", column 8, lines 23-24);

determining a plurality of scale factors corresponding to each of the sub-bands ("scale factors for the respective scale factor bands... are generated", column 9, lines 45-47) according to respective noise tolerance of each of the sub-bands ("so that the magnitude of the quantization noise of each scale factor band is smaller than the masking threshold", column 9, lines 42-43);

coding the quantized data in a base layer ("coding of the base layer", column 8, lines 28-29); and

truncating the quantized data (""bitstreams of lower bitrate", column 8, line 39).

However PARK does not disclose bit shifting the quantized data.

In the same field of scalable coding, CHEN teaches bit shifting the quantized data in the sub-bands ("perform bitplane shifting of frequency domain coefficients", column 6, lines, 36-37) by the respective scale factors ("shifting factors are determined solely as a function of the base layer", column 7, lines 30-31, where "the shifting factor acts similarly to the quantization step size used in the base layer", column 7, lines 49-50) if they exceed a threshold value ("by identifying blocks or macroblocks that have ... high quantization errors, and the like", column 6, lines 60-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

25. Regarding **claim 22**, PARK further teaches:

de-quantizing the coded data ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23); and

decoding the coded data ("bit-sliced arithmetic decoding portion 310 decodes side information and bit-sliced quantized data", column 8, lines 62-63).

However PARK does not disclose de-shifting the coded data.

In the same field of scalable coding, CHEN teaches de-shifting the coded data ("bit-planes are shifted only downward in the video decoder", column 13, lines 30-31). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

26. Regarding **claim 23**, CHEN further teaches discarding the least significant bits after the bit shifting (this is inherent in bit shifting, as there are no longer bits in the least significant places to code, see CHEN, column 3, lines 9-11).

27. Regarding **claim 24**, PARK further teaches:

coding the quantized data in a base layer and an enhancement layer ("after the coding of the base layer is completed, the side information for the next enhancement layer and the quantized values of audio data are coded", column 8, lines 28-31); and

truncating the quantized data in the enhancement layer up to respective layer size limits ("remaining quantized data uncoded due to a layer size limit", column 6, lines 16-17).

28. Regarding **claim 25**, PARK further teaches arithmetically coding the quantized data ("bit-sliced data are arithmetic-coded", column 11, lines 15-16).

29. Regarding **claim 27**, PARK further teaches that method is implemented in an additive fine granularity scalability structure ("fine granule scalability can be implemented", column 12, line 65).

30. Regarding **claim 28**, PARK teaches a system having an encoder and decoder processing audio signals ("encode and decode scalable stereo digital audio data", column 6, lines 53-54) comprising:

an encoder ("encoding apparatus", column 6, line 64) further comprising

a quantizer quantizing the audio signals in spectral lines into quantized data in a plurality of sub-bands ("quantizing portion 160 scalar-quantizes the frequency signals of each band", column 7, lines 65-66) in an order of most significant bits to least significant bits ("ranging from the MSB sequences to the LSB sequences", column 8, lines 23-24);

a psychoacoustic model determining a plurality of scale factors corresponding to each of the sub-bands ("scale factors for the respective scale factor bands... are generated", column 9, lines 45-47) according to respective noise tolerance of each of the sub-bands ("so that the magnitude of the quantization noise of each scale factor band is smaller than the masking threshold", column 9, lines 42-43);

a bit slicer coding ("bit-sliced arithmetic coding portion 170", column 8, line 18) and truncating the difference (""bitstreams of lower bitrate", column 8, line 39).

However PARK does not disclose a bit shifter.

In the same field of scalable coding, CHEN teaches a bit shifter shifting the quantized data in the sub-bands ("perform bitplane shifting of frequency domain coefficients", column 6, lines, 36-37) by the respective scale factors ("shifting factors are determined solely as a function of the base layer", column 7, lines 30-31, where "the shifting factor acts similarly to the quantization step size used in the base layer", column 7, lines 49-50) if they exceed a threshold value ("by identifying blocks or macroblocks that have ... high quantization errors, and the like", column 6, lines 60-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

31. Regarding **claim 29**, PARK further teaches a decoder comprising:

a scale factor decoder decoding the scale factors ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23);

a spectrum decoder decoding the quantized data ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23); and

a decoder decoding the coded data ("bit-sliced arithmetic decoding portion 310 decodes side information and bit-sliced quantized data", column 8, lines 62-63).

However PARK does not disclose a de-shifter de-shifting the coded data.

In the same field of scalable coding, CHEN teaches a de-shifter de-shifting the coded data ("bit-planes are shifted only downward in the video decoder", column 13, lines 30-31).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

32. Regarding **claim 30**, PARK further teaches that the system is implemented in MPEG-4 bit slice arithmetic coding ("bit-sliced arithmetic coding technique", column 6, lines 54-55).

33. Regarding **claim 31**, PARK teaches a method for processing audio signals ("encode and decode scalable stereo digital audio data", column 6, lines 53-54) comprising:

quantizing the audio signals in spectral lines into quantized data in a plurality of sub-bands ("quantizing portion 160 scalar-quantizes the frequency signals of each band", column 7, lines 65-66) in an order of most significant bits to least significant bits ("ranging from the MSB sequences to the LSB sequences", column 8, lines 23-24);

determining a plurality of scale factors corresponding to each of the sub-bands ("scale factors for the respective scale factor bands… are generated", column 9, lines 45-47) according to respective noise tolerance of each of the sub-bands ("so that the magnitude of the quantization noise of each scale factor band is smaller than the masking threshold", column 9, lines 42-43);

de-quantizing the coded data ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23);

coding ("bit-sliced arithmetic coding portion 170", column 8, line 18) and truncating the quantized difference (""bitstreams of lower bitrate", column 8, line 39).

However PARK does not disclose bit shifting.

In the same field of scalable coding, CHEN teaches bit shifting the difference in the sub-bands ("perform bitplane shifting of frequency domain coefficients", column 6, lines, 36-37) by the respective scale factors ("shifting factors are determined solely as a function of the base layer", column 7, lines 30-31, where "the shifting factor acts

similarly to the quantization step size used in the base layer", column 7, lines 49-50) if they exceed a threshold value ("by identifying blocks or macroblocks that have ... high quantization errors, and the like", column 6, lines 60-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

34. Regarding **claim 32**, PARK further teaches:

decoding the coded data ("bit-sliced arithmetic decoding portion 310 decodes side information and bit-sliced quantized data", column 8, lines 62-63).

However PARK does not disclose de-shifting the coded data.

In the same field of scalable coding, CHEN teaches de-shifting the coded data ("bit-planes are shifted only downward in the video decoder", column 13, lines 30-31). Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

35. Regarding **claim 33**, PARK further teaches:

amplifying the quantized data with the respective scale factors ("quantizing portion 160 scalar-quantizes the frequency signals of each band so that the magnitude of the quantization noise of each band is smaller than the masking threshold", column 7, lines 65-67); and

de-amplifying the decoded data with the respective scale factors ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23).

36. Regarding **claim 34**, PARK further teaches arithmetically coding the quantized data ("bit-sliced data are arithmetic-coded", column 11, lines 15-16).

37. Regarding **claim 35**, CHEN further teaches that the least significant bits, after bit shifting, are discarded (this is inherent in bit shifting, since there are no longer bits in the least significant places to code, see CHEN, column 3, lines 9-11).

38. Regarding **claim 36**, PARK teaches a processor for processing audio signals in an order of most significant bits to least significant bits ("coded in the order ranging from the MSB sequences to the LSB sequences", column 8, lines 23-24), the processor comprising:

a psychoacoustic model determining a plurality of scale factors corresponding to each of the sub-bands ("scale factors for the respective scale factor bands… are generated", column 9, lines 45-47) according to respective noise tolerance of each of

the sub-bands ("so that the magnitude of the quantization noise of each scale factor band is smaller than the masking threshold", column 9, lines 42-43); and

a bit slicer coding ("bit-sliced arithmetic coding portion 170", column 8, line 18) and truncating the quantized difference (""bitstreams of lower bitrate", column 8, line 39).

However PARK does not disclose a bit shifter.

In the same field of scalable coding, CHEN teaches a bit shifter shifting the quantized data in the sub-bands ("perform bitplane shifting of frequency domain coefficients", column 6, lines, 36-37) by the respective scale factors ("shifting factors are determined solely as a function of the base layer", column 7, lines 30-31, where "the shifting factor acts similarly to the quantization step size used in the base layer", column 7, lines 49-50) if they exceed a threshold value ("by identifying blocks or macroblocks that have ... high quantization errors, and the like", column 6, lines 60-62).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to use the bit shifting method of CHEN with the scalable coding method of PARK in order to give important parts of the signal "higher priority in the encoding process" (CHEN, column 2, lines 65-66) which improves the signal's quality (see CHEN, column 7, lines 4 and PARK, column 12, line 65).

39. Regarding **claim 37**, PARK further teaches a quantizer quantizing the processed audio signals ("quantizing portion 160 scalar-quantizes the frequency signals of each band", column 7, lines 65-66).

40. Regarding **claim 38**, PARK further teaches:

a quantizer quantizing the processed audio signals ("quantizing portion 160 scalar-quantizes the frequency signals of each band", column 7, lines 65-66);

a de-quantizer de-quantizing the processed audio signals ("inverse quantizing portion 320 restores the decoded scale factor and quantized data into signals having the original magnitudes", column 9, lines 21-23); and

a subtractor taking a difference between the quantized audio signals and the de-quantized audio signals ("difference between the predicted value and the actual frequency component is quantized and coded", column 7, lines 47-49).

41. **Claims 8 and 26** are rejected under 35 U.S.C. 103(a) as being unpatentable over PARK et al. (Patent No.: US 6,529,604) in view CHEN et al. (Patent No.: US 6,263,022) in further view of TSUSHIMA et al. (Patent No.: US 6,678,653).

42. Regarding **claim 8**, PARK and CHEN teach all of the claimed limitations of claim 1. However, PARK and CHEN do not disclose that the scale factor of a sub-band is determined based upon an original spectral energy level, a common scale factor, and band scale factor values of the sub-band.

In the same field of signal coding, TSUSHIMA teaches that the scale factor of a sub-band ("absolute scale factor ASF(B)", TSUSHIMA, column 4, lines 19-20) is determined based upon an original spectral energy level (see TSUSHIMA, column 5,

equation [2], SF(B) is calculated using a MDCT, the MDCT outputs spectral energy levels), a common scale factor ("value of the common scale factor Com", TSUSHIMA, column 4, line 22), and band scale factor values of the sub-band ("scale factor SF(B)", TSUSHIMA, column 4, line 23).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to calculate the scale factor used by PARK and CHEN using the method of TSUSHIMA in order to "decrease the quantity of calculation" (TSUSHIMA, column 1, lines 48-49).

43. Regarding **claim 26**, PARK and CHEN teach all of the claimed limitations of claim 21. However, PARK and CHEN do not disclose that the scale factor of a sub-band is determined based upon an original spectral energy level, a common scale factor, and band scale factor values of the sub-band.

In the same field of signal coding, TSUSHIMA teaches that the scale factor of a sub-band ("absolute scale factor ASF(B)", TSUSHIMA, column 4, lines 19-20) is determined based upon an original spectral energy level (see TSUSHIMA, column 5, equation [2], SF(B) is calculated using a MDCT, the MDCT outputs spectral energy levels), a common scale factor ("value of the common scale factor Com", TSUSHIMA, column 4, line 22), and band scale factor values of the sub-band ("scale factor SF(B)", TSUSHIMA, column 4, line 23).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to calculate the scale factor used by PARK and CHEN

using the method of TSUSHIMA in order to "decrease the quantity of calculation" (TSUSHIMA, column 1, lines 48-49).

Conclusion

44. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Joel Stoffregen whose telephone number is (571) 270-1454. The examiner can normally be reached on Monday - Friday, 9:00 a.m. - 6:30 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Edouard can be reached on (571) 272-7603. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

JS

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